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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/774,875 | 02/01/2001 | Justin C. Chuang | 2000-0071 | 3156 |
| 7590 | 02/08/2005 | | EXAMINER | |
| MR.S.H.DWORETSKY AT&T CORP., ROOM 2A-207 ONE AT&T WAY BEDMINISTER, NJ 07921 | | | TSE, YOUNG TOI | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2637 | |

DATE MAILED: 02/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/774,875

Applicant(s)

CHUANG ET AL.

Examiner

YOUNG T. TSE

Art Unit

2637

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 October 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3,7-12,15,16,21-24 and 26-36 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3,7-12,15,16,21-24 and 26-36 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 October 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. The drawings were received on 04 October 2004. These drawings are acceptable.
2. The drawings are objected to because the block elements 155 and 160 shown in the replacement sheet Figure 1A should be labeled "FFT" and "DEMODULATOR", respectively. Further, in the replacement sheet Figure 6B, step 685 should be labeled as " $n = n-1$ " to clarify the changes. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required

corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

3. The substitute specification filed 04 October 2004 has not been entered because it does not conform to 37 CFR 1.125(b) and (c) because: no markup copy has been provided to show the changes over the original specification.
4. The disclosure is objected to because of the following informalities: in paragraph [023], line 6 and lines 7-8, "de interleaver" should be changed to either "deinterleaver" or "de-interleaver"; in paragraph [024], line 9, "195" should be "185"; in paragraph [038], line 1, it is required to update the Serial Application No. 09/089,862, now U.S. Patent No. 6,327,314. Appropriate correction is required.

Claim Objections

5. Claims 2-3, 7-12, 15-16, 21-24, 26 and 28-36 are objected to because of the following informalities:

In claim 2, line 18, "said block" should be "said transformed block"; lines 19, "a training block" should be "said training block,"; and line 26, "a training block" should be "said training block".

In claim 7, line 3, "said multicarrier received signal" should be "said received multicarrier signal".

In claim 9, line 6, the phrase "and transformed" should be deleted.

In claim 15, line 1, "Fast Fourier" should be "the Fast Fourier". Also see claim 26 and claim 36.

In claim 16, line 7, "further comprises the steps of;" should be "comprises the steps of."; line 8, "the received signal" should be "the received multicarrier signal"; and line 18, "received signal" should be "the received multicarrier signal".

In claim 21, line 3, "said multicarrier received signal" should be "said received multicarrier signal".

In claim 22, lines 2-3, "if said combined signal was interleaved for transmission" should be "prior the Viterbi decoding step". Also see 31.

In claim 28, line 2, the word "further" should be deleted; line 3, "the received signal" should be "the received multicarrier signal"; and line 13, "received multicarrier signal" should be "the received multicarrier signal".

In claim 29, line 13, "received multicarrier signal" should be "the received multicarrier signal".

In claim 30, line 3, "said multicarrier received signal" should be "said received multicarrier signal".

In line 2 of claims 32-35, "QPSK techniques" should be "QPSK demodulation techniques".

In claim 35, line 1, "claim 20" should be "claim 21" since claim 20 has been cancelled.

Wherein the dependent claims 3, 8, 11-12 and 23-24 depend upon claims 2, 7, and 21, respectively.

Applicants are suggested to use the word "cancelled" after the cancelled claims instead of "delete" in the next response.

Appropriate correction is required.

6. Claim 10 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. The claimed subject matter of claim 10 is already recited in claim 7.

Double Patenting

7. Claim 24 is objected to under 37 CFR 1.75 as being a substantial duplicate of claim 23 (notice claim 24 is identical to claim 23). When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 112

8. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

9. Claims 16, 21, 26, and 28-29 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject

matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The steps recited in claims 16 and 28-29 do not correspond to the flowcharts shown in Figures 6A and 6B of the iterative forward processing and the iterative backward processing. Further, at least some of the steps lack cooperation with each other as discussed in the specification or shown in Figures 6A and 6B.

Wherein claims 21 and 26 depend upon claim 16.

10. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

11. Claims 1-3, 7-12, 16, 21-24, and 26-36 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1 (line 7), claim 16 (lines 14, 16, and 21), claim 27 (line 8), claim 28 (lines 9 and 11), claim 29 (lines 9 and 11), the phrases "said transformed multicarrier signal", said received block", and "the block number" all lack antecedent basis.

In claim 7, lines 1-2, the phrase "each of said decoding steps" is indefinite since claim 1 has one decoding step only, further, the phrase "said decoding steps" lacks antecedent basis.

In claims 16 and 28-29, some of the method steps lack cooperation with the precedent steps.

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In claim 21, line 1, "said decoding step" lacks antecedent basis since claim 16 recites two decoding steps. In other words, it is unclear which decoding step is referred to?

Wherein the dependent claims 2-3, 8-12, 15, 22-26, and 30-36 are directly or indirectly depend upon the independent claims 1, 16 and 27.

Claim Rejections - 35 USC § 102

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

13. Claims 1, 15, 27 and 36 are rejected under 35 U.S.C. 102(e) as being anticipated by Cimini, Jr. et al. (Previously cited in PTO-892).

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Cimini, Jr. et al. (U.S. Patent No. 6,327,314) discloses a method and apparatus in Figure 1 provide channel estimation for multicarrier OFDM system.

With respect to claims 1, 15, 27 and 36, the multicarrier OFDM system shown in Figure 1 comprises a transmitter section 110 and a receiver section 160. The receiver section 160 comprises a plurality of Fast Fourier transformers FFT (1621 and 1622) for receiving multicarrier signals from the transmitter section 110; a channel estimation circuit 170 for estimating the channel characteristics of the multicarrier signals from the FFT transformers 1621 1622 using iterative forward processing as recited in claim 1 and also using iterative backward processing, which is feedback from a reference generator 175 through signal adjusters 1641 and 1642, a summation device 166, a demodulator 167 and a R-S decoder 168 as recited in claim 27, wherein the transformed multicarrier signals are decoded by the R-S decoder 168. See column 1, lines 51-62 and column 4, lines 26-49.

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

15. Claims 7-12 and 30-34 are rejected under 35 U.S.C. 103(a) as being obvious over Cimini, Jr. et al. in view of Toskala et al. (Newly cited).

The applied reference has a common inventor with the instant application.

Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). For applications filed on or after November 29, 1999, this rejection might also be overcome by showing that the subject matter of the reference and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person. See MPEP § 706.02(I)(1) and § 706.02(I)(2).

Cimini, Jr. et al. discloses all the claimed subject matter as applied to claims 1 and 27, which is already discussed in paragraph 13 above. However, Cimini, Jr. et al. does not explicitly show or suggest all the claimed subject matter as recited in claims 7-12 and 30-34.

Toskala et al. (U.S. Patent No. 6,480,554) also discloses a method and apparatus in Figures 1A-1C for channel estimation in a CDMA communication system.

In Figure 1A, a coherent combiner & demodulator 38 is provided after a channel estimation unit 37 for demodulating and combining the channel estimation of the channel characteristics (claims 9-10 and 30).

In Figure 1B or 1C, a deinterleaving circuit 46 and a Viterbi decoding circuit 48 are provided after the coherent combiner & demodulator 38 via a bit detection circuit 42 for deinterleaving and Viterbi decoding the demodulated signal (claims 7-8 and 30-31).

With respect to claims 11-12, the demodulator 167 shown in Figure 1 of the Cimini's patent is performed for all signals of the multicarrier signals.

With respect to claims 32-34, the demodulator 167 shown in Figure 1 of the Cimini's patent (column 1, lines 51-62) and the demodulator 38 shown in Figure 1A of the Toskala's patent (column 4, lines 53-55) are performed using QPSK demodulation techniques.

Therefore, it would have been obvious to one of ordinary skill in the art to include a combiner circuit and a deinterleaver circuit in Cimini's receiver circuit between the demodulator 167 and the R-S decoder 168 for the purpose of combining the result of the demodulated signals and interleaving the demodulated signal before applying the demodulation signal for error correction to the R-S decoder 168 as taught by Toskala.

Allowable Subject Matter

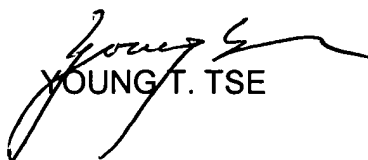
16. Claims 2-3 and 28-29 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 1st and 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

17. Claims 16, 21-23, 26, and 35 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 1st^t and 2nd paragraph, set forth in this Office action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to YOUNG T. TSE whose telephone number is (571) 272-3051. The examiner can normally be reached on Monday and Wednesday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on (571) 272-2988. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


YOUNG T. TSE

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Primary Examiner
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